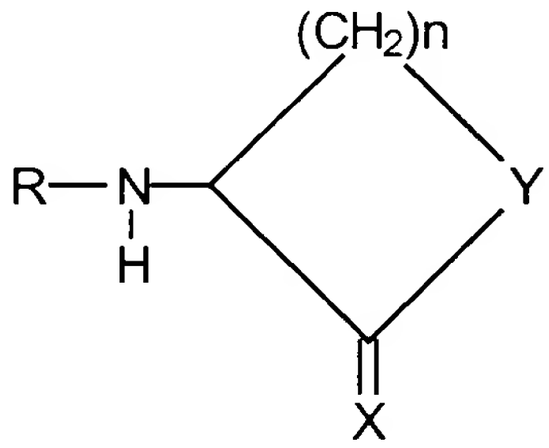
determining whether the suspected inhibitor inhibits the ability of the autoinducer molecule to stimulate the activity of a selected gene; and

selecting the suspected inhibitors that inhibit the autoinducer molecule.

Please add new claims 54-79 as follows:

--54. (New) The method of claim 44, wherein the autoinducer molecule comprises a molecule of the formula I:



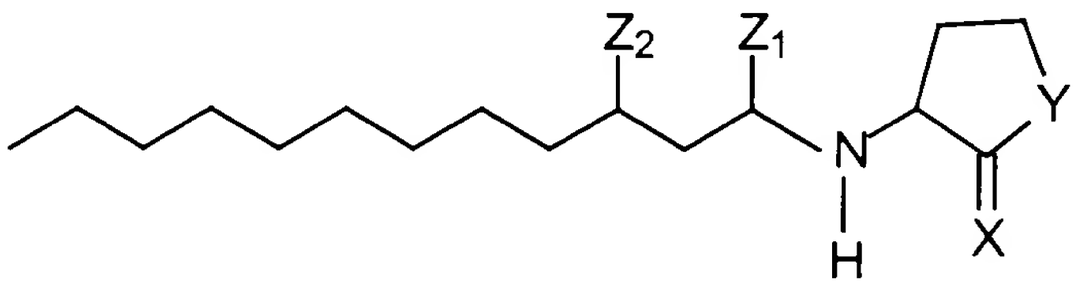
wherein n is 2 or 3; Y is O, S, or NH; X is O, S, or NH; and R is a fatty hydrocarbon or acyl moiety that may be substituted or a moiety having at least seven members containing a ring structure that may be substituted, wherein the molecule is able to stimulate the activity of the selected gene of *Pseudomonas aeruginosa*.

55. (New) The method of claim 54 wherein R is a C_7 - C_{14} acyl moiety.

56. (New) The method of claim 55 wherein R is a C_{10} or higher acyl moiety.

57. (New) The method of claim 56 wherein R is a C_{12} acyl moiety.

58. (New) The method of claim 57, wherein the autoinducer molecule comprises a molecule of the formula II:



wherein X is O, S, or NH; Y is O; and Z_1 and Z_2 are independently selected from the group consisting of hydrogen, =O, =S, and =NH.

59. (New) The method of claim 44, wherein the autoinducer molecule is N-(3-oxododecanoyl)homoserine lactone.

60. (New) The method of claim 54 wherein R contains a heterocyclic ring structure.

61. (New) The method of claim 60 wherein the heterocyclic ring structure has five to seven ring members.

62. (New) The method of claim 61 wherein the heterocyclic ring structure contains oxygen.

63. (New) The method of claim 54 wherein R contains a carbocyclic ring structure.

64. (New) The method of claim 63 wherein the carbocyclic ring structure is a fused ring system.

65. (New) The method of claim 54 wherein the molecule is purified from its native source.

66. (New) The method of claim 65 wherein the native source is the culture media of *Pseudomonas aeruginosa*.

67. (New) The method of claim 54 wherein the molecule is synthesized by chemical means.

68. (New) The method of claim 54 wherein the molecule is an optically active isomer.

69. (New) The method of claim 68 wherein the isomer is the L-isomer.

70. (New) The method of claim 68 wherein the isomer is the D-isomer.

71. (New) The method of claim 44, wherein the selected gene is the *lasR* gene.

72. (New) The method of claim 71, wherein the *lasR* gene encodes a protein selected from the group of transcriptional activator proteins of *Pseudomonas aeruginosa*.

73. (New) The method of claim 72, wherein the transcriptional activator protein is the LasR protein.

74. (New) The method of claim 44, wherein the step of contacting the autoinducer molecule with the suspected inhibitor further comprises combining the autoinducer molecule and the suspected inhibitor with *E. coli* MG4.

75. (New) The method of claim 74, wherein the step of measuring the ability of the treated autoinducer molecule to stimulate the activity of the selected gene comprises measuring the amount of β-galactosidase produced as a result of combining the autoinducer molecule and the suspected inhibitor with *E. coli* MG4.

76. (New) The method of claim 75, wherein the step of determining whether the suspected inhibitor inhibits the ability of the autoinducer molecule to stimulate the activity of the selected gene comprises comparing the amount of β-galactosidase produced to a standard to determine if the suspected inhibitor represses the ability of the autoinducer to stimulate the production of β-galactosidase.

77. (New) An inhibitor of an autoinducer molecule of *Pseudomonas aeruginosa*, wherein the inhibitor is selected by the method of claim 44.

78. (New) The inhibitor of claim 77, wherein the inhibitor is an analog of N-(3-oxododecanoyl)homoserine lactone.

79. (New) The inhibitor of claim 78, wherein the analog is an antagonist of the LasR protein of *Pseudomonas aeruginosa*.--